

CLAIMS

1. An installation for manufacturing of shaped elements from fibrous waste material, said installation comprising;

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- means for mixing a portion of fibrous waste material with at least water,
 - at least one conveyor belt for transporting said mass of waste material and water,
 - a first press for pressing and draining the mass for an amount of surplus water,
 - a second press adapted to co-operate with said conveyor belt for simultaneously
- 10 pressing and vibrating the mass, and
- means for cutting said pressed mass into elements of predetermined lengths.

2. An installation according to claim 1, wherein the first and/or second press comprises

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- one or more pressing surfaces oppositely arranged in relation to a supporting surface of the conveyor belt supporting said mass, and
 - opposing side surfaces,

at least one said pressing surfaces and/or side surfaces and/or the supporting surface

20 being perforated, so as to drain water from the mass when the mass is pressed between the surfaces, and

wherein at least one of said surfaces is adapted to vibrate in relation to the mass.

25 3. An installation according to claim 2, wherein the one or more pressing surfaces vibrate in relation to the mass and conveyor belt.

4. An installation according to claim 2 or 3, wherein the side surfaces vibrates in relation to the mass.

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5. An installation according to claim 2, wherein the conveyor belt vibrates in relation to the mass.

6. An installation according to any of claims 2-5, wherein the distance between the

35 pressing surfaces and the supporting surface of the conveyor belt decreases in the conveying direction.

7. An installation according to claim 6, wherein said distance is adjustable by moving the first and/or second press up or down.
8. An installation according to any of claims 2-7, wherein the pressing surfaces and/or side
5 surfaces are adapted to move the mass.
9. An installation according to any of claims 1-8, wherein the first and/or second press comprises a conveyor belt being perforated.
- 10 10. An installation according to any of claims 1-9, further comprising a parallel nozzle oppositely arranged in relation to said conveyor belt for providing a uniform material thickness.
11. An installation according to any of claims 1-10, further comprising an oven for drying
15 said elements.
12. An installation according to any of claims 1-10, and comprising a further press for pressing said mass or elements after having been dried.
- 20 13. An installation according to any of claims 1-12, and comprising a mill for grinding the mass before being drained.
14. An installation according to any of claims 1-13, and comprising pumping means for pumping said waste material, water and polymer(s) through the installation.
- 25 15. An installation according to any of claims 1-14, wherein mass is transported continuously through said installation in one endless row until it is cut into said elements.
16. An installation according to any of claims 2-15, wherein the pressing surfaces
30 comprises one or more vibrating pressing elements.
17. An installation according to claim 16, wherein the vibrating pressing elements comprises eccentric pressing elements.
- 35 18. An installation according to any of claims 2-17, wherein the first and/or second press comprises one or two or more separate vibrating pressing surfaces adjacently arranged and at different levels in relation to the conveyor belt supporting the mass.

19. An installation according to any of the preceding claims, wherein the first and/or second press is a filter belt press.

20. An apparatus for pressing a mass of fibrous waste material, said apparatus comprising

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- an upper and a lower opposing surface, at least a part of one of the surfaces being perforated, so as to drain the mass when the mass is pressed between the surfaces, and

10 wherein at least one of the surfaces is adapted to vibrate in relation to the mass.

21. An apparatus according to claim 20, wherein the upper and lower surface is perforated.

22. An apparatus according to claim 20 or 21, wherein the upper and the lower surfaces
15 are vibrated in relation to each other.

23. An apparatus according to any of claims 20-22, wherein at least one of the upper and lower surfaces are adapted to move the mass.

20 24. An apparatus according to any of claims 20-23, and comprising any of the features of the second press of the installation according to claims 1-19.

25. A method of manufacturing shaped elements from fibrous waste material, comprising the steps of:

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- providing a raw material of fibrous waste material,
- mixing said raw material with at least water,
- transporting said mixed mass of waste material and water on a conveyor belt through a first press for pressing and draining said mass,
- 30 - transporting said mass through a second press for simultaneously pressing and vibrating the mass, and
- cutting said pressed mass into elements of predetermined lengths.

26. A method according to claim 25, wherein the first and/or second press is adapted to
35 co-operate with said conveyor belt, said press comprising

- one or more pressing surfaces oppositely arranged in relation to a supporting surface of the conveyor belt supporting said mass, and
- opposing side surfaces,

at least one of said pressing surfaces and/or side surfaces and/or the supporting surface being perforated, so as to drain water from the mass when the mass is pressed between the surfaces, and

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wherein at least one of said surfaces is vibrating in relation to the mass.

27. A method according to claim 25 or 26, further comprising, subsequently to the step of vibrating, the step of drying the mass at elevated temperatures.

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28. A method according to any of claims 25-27, wherein the step of draining comprising transporting the mass through a belt press.

29. A method according to any of claims 25-28, further comprising, subsequently to the
15 step of draining, the step of transporting said mass on the conveyor through a parallel nozzle.

30. A method according to any of claims 25-29, further comprising a third pressing step being provided by said second press or a stationary press.

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31. A method according to any of claims 25-30, wherein the mass is pumped from the mixer to a buffer tank before being provided on said conveyor belt.

32. A method according to claim 31, wherein the mass is milled in a grinder or mill prior to
25 entering the buffer tank.

33. A method according to any of claims 25-32, wherein the step of mixing comprising mixing the raw material so as to result in a water content in the mass of 70-90%.

30 34. A method according to any of claims 25-33, wherein the water content of the mass after the second step of pressing is 30-60%.

35. A method according to any of claims 27-34, wherein the drying step comprises drying at a temperature in the range of 120-240°C, such as 150-220°C.

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36. A method according to any of claims 25-35, wherein the drying step is carried out for a period of time sufficient to result in a water content in the material of not more than about 2-12%, such as 5%.

37. A method according to any of claims 25-36, wherein the conveyor belt is perforated for drainage of surplus water from the mass.

38. A method according to any of claims 25-37, wherein mass is transported continuously
5 in an endless row on said conveyor belt.

39. A method according to any of claims 25-38, wherein the speed of the mass being transported through the first and/or second press is 1-10 meter pr. minute, such as 2-9 or 3-8 or 4-7 or 5-6 meter pr. minute.

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40. A method according to any of claims 25-39, and carried out by the use of an installation according to any of claims 1-19.

41. A method according to any of claims 25-40, wherein the raw material of fibrous waste
15 material comprises;

- 30-40% of water
- 60-70% of solids comprising:

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- 30-40% cellulose fibres
- 65-70% chalk, clay and kaolin
- 2-8% other ingredients such as amines and scraps of soap.

42. A method according to any of claims 25-41, wherein the solid percent is increased by
25 adding filling material.

43. A method according to claim 42, wherein the filling material comprises rest-material that has been cut away, when cutting the elements into preferred length, and/or dust from the manufacturing process.

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44. A method according to any of claims 25-43, wherein the raw material is mixed with a polymer.